III. REMARKS

Claims 1-27 are pending in this application. By this amendment, claims 1, 10 and 23 have been amended. These amendments are being made to facilitate early allowance of the presently claimed subject matter. Applicants do not acquiesce in the correctness of the rejections and reserve the right to present specific arguments regarding any rejected claims not specifically addressed. Further, Applicants reserve the right to pursue the full scope of the subject matter of the original claims in a subsequent patent application that claims priority to the instant application. Reconsideration in view of the following remarks is respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. 1.116(b) because the Amendment: (a) places the application in condition for allowance as discussed below; (b) does not raise any new issues requiring further search and/or consideration; and (c) places the application in better form for appeal. Accordingly, Applicants respectfully request entry of this Amendment.

In the Office Action, claims 4-9, 16-22 and 24-27 are rejected under 35 U.S.C. §112 as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claims 1-27 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Sung-Il Chien and Yung-Mok Baek, Hierarchical Block Matching Method for Fast Rotation of Binary Images, hereafter "Chien" in view of Suchendra M. Bhandarkar and Huaiyuan Yu, VLSI Implementation of Real-Time Image Rotation, hereafter "Bhandarkar." These rejections are respectfully traversed for the reasons stated below.

A. REJECTION OF CLAIMS 4-9, 16-22 AND 24-27 UNDER 35 U.S.C. §112

The Office has asserted that claims 4-9, 16-22 and 24-27 are indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection. Specifically, the Office asks the following questions:

a. How does a person of skill in the art calculate the value of skew angle in order to find the value of K_h and K_v? In one embodiment, the skew angle of the claimed invention may be an angle that removes a skew such as by rotating a skewed image to be horizontal. Page 7, lines 15-17. The skew angle is not so much calculated, as it is determined by establishing the four corners of a skewed image in a known fashion. Page 9, lines 5-6. Determination of a skew, to the horizontal for example, would be obvious to one skilled in the art after the four corners of the skewed image are established. In an alternative embodiment, the skew angle may be set to any desired angle by a user. Page 8, line 20 through page 9, line 2; page 12, line 18 through page 13, line 7.

b. Are K_h and K_v considered as coefficients for the skew angle and the data points? As defined in the specification, "...K_h and K_v are fractions that are functions of skew angle α and data point (pixel) location of initial image 130." Page 9, lines 13-14. K_h and K_v are the weights to be applied to the particular data points to generate a value of a new, rotated data point. These values, for a constant skew angle, may change depending on the data point (pixel) location of initial image 130. For example, for the first 7 pixels in a particular row, the weighting (K_h) may be 1/8, then 2/8 for the next 7 and so on.

c. Does the first image rotate to the right and left in step of 1/8th within the range of ±90° or the range of 360°? In reading this question, as well as the Office's arguments in the Office action, it appears that the Office believes that the claimed invention may only rotate the image by increments of 1/8th of a circle (i.e., 45°). In doing so, it appears that the Office confuses the weights K_h and K_v (e.g., 1/8, 2/8, 3/8, etc.) that are applied to original pixel values to yield non-skewed pixel values with the skew angle, itself. In contrast, the skew angle may be any desired angle. Page 9, lines 1-2; page 12, lines 20-21. Specific examples of 1°, 1.14°, and 15° are given in the specification. Page 11, line 17; page 13, line 4.

d. Does the first image rotate in step smaller than of 1/8th within a smaller range at a time? Applicants refer the Office to the answer to question c.

e. How does Applicant estimate the skew angle? Applicants respectfully refer the Office to the answer to question a. The skew angle is not estimated, it is determined based on the skew of the image.

Applicants assert that the terms K_h, K_v, skew angle, and data point location of the first image are clearly defined in the application, including but not limited to the above quotations. Accordingly, Applicants respectfully submit that the above quoted sections, as well as other sections of the specification, sufficiently describes the feature such that one skilled in the art would be enabled. Accordingly, Applicants request that the rejection be withdrawn.

B. REJECTION OF CLAIMS 1-27 UNDER 35 U.S.C. §103(a)

With regard to the 35 U.S.C. §103(a) rejection over Chien in view of Bhandarkar, Applicants initially assert that Chien teaches away from the combining of the references. In

particular, Bhandarkar teaches image rotation that uses integer additions. Page 1015, col. 1, paragraph 2. The presence of these integer additions means that calculations must be performed in order to perform the Bhandarkar image rotation. The Office asserts that Section I of Chien also teaches this type of calculation. However, the Section I of Chien is an introductory section and the calculations that the Office refers to in this section merely illustrate a "general method" for image rotation. Page 484, col. 1. The remainder of the section and all of sections II, III and IV of the publication teaches "...a hierarchical block matching method for fast rotation of binary images..." that, rather than being a second step as the Office asserts, is an alternative to the "general method." Page 484, col. 2, para. 1. It is to these sections that the Office refers in its Office Action. The preferred method taught by these sections of Chien includes "...replac[ing] traditional calculation of rotation operations with simple matching of block patterns and drawing of their PMPs (predrawn mapping patterns)." Page 488, col. 2, IV. Conclusions section. As such, the calculations of Bhandarkar are incompatible with the teachings of Chien relied on by the Office. Accordingly, Applicants assert that the Office has failed to submit a *prima facie* case of obviousness and requests the withdrawal of the rejection.

With further regard to the 35 U.S.C. §103(a) rejection over Chien in view of Bhandarkar, Applicants assert that the combined references cited by the Office fail to teach or suggest each and every feature of the claimed invention. For example, with respect to independent claim 1, Applicants respectfully submit that, contrary to the argument of the Office, Bhandarkar fails to teach or suggest, *inter alia*, "...creating a rotated image that is substantially free of aliasing error using weighted sums of a plurality of data points of the first image, wherein weighting depends on a skew angle of the first image and data point location in the first image" and similarly

claimed in claims 10 and 23. Instead, Bhandarkar teaches generating addresses by adding the x-value to the cosine of the angle and adding the y-value to the sine of the angle. Page 1016, col. 1, paragraph 2. The Office argues that Bhandarkar teaches adjusting a reflect value or proportion of the sum. Office Action, page 3, line 12. However, the calculations in the section and figure of Bhandarkar cited by the Office calculate a new x-coordinate and y-coordinate for an existing value and do not create a rotated image using weighted sums of a plurality of data points of the first image. In contrast, the claimed invention includes "...creating a rotated image that is substantially free of aliasing error using weighted sums of a plurality of data points of the first image, wherein weighting depends on a skew angle of the first image and data point location in the first image." Claim 1. As such, the rotated image as included in the claimed invention is not generated by simply adding a cosine or sine of an angle to an x or y value, but are instead created using weighted sums of a plurality of data points of the first image, wherein weighting depends on a skew angle of the first image and a data point location in the first image. For the above stated reasons, the address generation in Bhandarkar is not equivalent to the creation of a rotated image as included in the claimed invention. Chien does not cure this deficiency. Accordingly, Applicants respectfully request withdrawal of the rejection.

With further regard to the 35 U.S.C. §103(a) rejection over Chien in view of Bhandarkar and further in view of unsupported factual assertions that the Office claim are obvious, Applicants submit that the Office's factual assertions amount to Official Notice. Applicants further submit that the Office's factual assertions are not properly based upon common knowledge. For example, Applicants assert that a method of rotating a first image in an image buffer is not obvious to one skilled in the art as asserted by the Office. Neither Chien nor

Bhandarkar disclose rotating an image in an image buffer. The section of Bhandarkar cited by the Office teaches that "[t[he values of the trigonometric functions sin θ and cos θ are precomputed and stored in a PLA instead of being computed on the fly." Page 1016, section 2.1. This passage does not teach rotating a first image *in an image buffer*, but instead pre-computation of sin and cos values. Furthermore, Chien discloses only an image that is "...obtained by scanning [a] document using optical scanners." Page 487, col. 1, final paragraph. Nowhere does either Chien or Bhandarkar teach or suggest a method of rotating a first image in an image buffer. Accordingly, Applicants respectfully request that the Office withdraw the rejection or support the finding with references that show this feature.

Applicants further assert that the step of extracting first image data from the image buffer is not obvious to one skilled in the art as asserted by the Office. As argued above, neither Chien nor Bhandarkar discloses an image buffer. Instead, Chien discloses only an image that is "...obtained by scanning [a] document using optical scanners." Page 487, col. 1, final paragraph. Similarly, Bhandarkar discloses only a VLSI device for processing an image. Nowhere does either Chien or Bhandarkar teach or suggest extracting first image data from the image buffer. Accordingly, Applicants respectfully request that the Office withdraw the rejection or support the finding with references that show this feature.

Applicants still further assert weighting that depends on a skew angle of the first image and data point location in the first image is not obvious to one skilled in the art as asserted by the Office. Instead, as argued above, Bhandarkar teaches generating addresses by adding the x-value to the cosine of the angle and adding the y-value to the sine of the angle. Page 1016, col. 1, paragraph 2. In contrast, Chien teaches "...replac[ing] traditional calculation of rotation

operations with simple matching of block patterns and drawing of their PMPs (predrawn mapping patterns)." Page 488, col. 2, IV. However, neither teaches or suggests weighting or that weighting depends on a skew angle of the first image and data point location in the first image. Accordingly, Applicants respectfully request that the Office withdraw the rejection or support this finding, as well as all other unsubstantiated findings, with references that show the features.

With respect to claim 4, Applicants respectfully submit that, contrary to the argument of the Office, Chien fails to teach or suggest, *inter alia*, "...applying the following algorithm to the first image data:

$$V_0 = K_h * K_v (V1 + V4 - V2 - V3) + K_h (V3 - V4) + K_v (V2 - V4) + V4$$

wherein V_0 is a data point of the rotated image; V1, V2, V3 and V4 are first image data points that each incorporated a portion of V_0; and K_h and Kv are fractions that are functions of skew angle and data point location of the first image" and similarly claimed in claims 16, 24 and 27. The Office admits that Chien does not explicitly specify the algorithm as included in the claimed invention. However, the Office appears to argue that simply because Chien has an equation that uses an angle, the equations are identical. However, the Chien equation does not use multiple first image data points V1, V2, V3 and V4 and fractions that are functions of skew angle and data point location of the first image K_h and K_v. In contrast, the algorithm as included in the claimed invention does not merely include an angle, as does the equation in Chien, but rather includes the entirety of the expression specified above. Furthermore, in response to the Office's incorrect assumption that rotation of the claimed invention can only be in 45° degree increments, Applicants respectfully refer the Office to the passages of the specification cited in answer to question c above. Instead, the 1/8 increments cited by the Office exemplify a

component of one method for calculating weighting functions K_h and K_v. For the above stated reasons, the equation in Chien is not equivalent to the algorithm as included in the claimed invention. Accordingly, Applicants respectfully request that the Office's rejection be withdrawn.

With respect to claim 7, Applicants respectfully submit that, contrary to the argument of the Office, Chien fails to teach or suggest, *inter alia*, "...applying the following algorithm to the first image data:

$$V_0 = K_h (V3 - V4) + K_v (V2 - V4) + V4$$

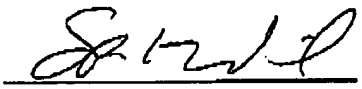
wherein V_0 is a data point of the rotated image; V2, V3, and V4 are data points of the first image that each incorporate a portion of V_0; and K_h and K_v are fractions that are functions of skew angle and data point location of the first image" and similarly claimed in claims 19 and 25. As with claim 4, the Office admits that Chien does not explicitly specify the algorithm as included in the claimed invention. However, the Office appears to argue that simply because Chien has an equation that uses an angle, the equations are identical. As argued above, the equation in Chien is not equivalent to the algorithm as included in the claimed invention. Accordingly, Applicants respectfully request that the Office's rejection be withdrawn.

With regard to the Office's other arguments regarding dependent claims, Applicants herein incorporate the arguments presented above with respect to independent claims listed above. In addition, Applicants submit that all dependant claims are allowable based on their own distinct features. However, for brevity, Applicants will forego addressing each of these rejections individually, but reserve the right to do so should it become necessary. Accordingly, Applicants respectfully request that the Office withdraw its rejection.

IV. CONCLUSION

Applicants respectfully submit that the application is in condition for allowance. Should the Examiner believe that anything further is necessary to place the application in better condition for allowance, he is requested to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,



Spencer K. Warnick
Reg. No. 40,398

Date: August 3, 2005

Hoffman, Warnick & D'Alessandro LLC
Three E-Comm Square
Albany, New York 12207
(518) 449-0044
(518) 449-0047 (fax)